

application, Applicants are submitting a terminal disclaimer and fee herewith. Accordingly, it is respectfully submitted that this rejection has been overcome, and it is requested that the rejection be withdrawn.

As independent Claim 28 is not rejected over the prior art, it is respectfully requested that independent Claim 28 and those claims dependent thereon now be allowed.

Claim Rejections - 35 USC §103

Claims 1-4, 6-11, 13-16, 18-27, 40, 42-47 and 49-52

The Examiner also rejects Claims 1-4, 6-11, 13-16, 18-27, 40, 42-47 and 49-52 under 35 USC §103 as being unpatentable over Oikawa et al. (US 4,770,948) in view of Prall et al. (US 5,341,016). This rejection is also respectfully traversed.

The present invention, as recited in pending rejected independent Claims 1, 4, 16, 40 and 52, is directed to a semiconductor device having a wiring which comprises a metal film and a nitride film of the metal, wherein the wiring (metal film in Claim 40) includes at least one inert element and 90% or more of the inert element is argon, and an amount of sodium contained within the metal film is equal to or less than 0.3 ppm. See e.g. Claim 4. Independent Claims 1, 16 and 52 recite that the wiring comprises a tungsten film. Applicants respectfully submit that the features of these claims are not disclosed or suggested by the cited references.

The Examiner, however, contends in the Final Rejection, that Oikawa discloses a semiconductor device comprising wirings (5) formed over a substrate (1), the wirings comprising a tungsten film, and wherein an amount of sodium within the tungsten film is equal to or less than 0.3 ppm (emphasis added). Applicants respectfully disagree.

The claimed invention clearly recites an amount of sodium within the metal (tungsten) film

of the wiring. In contrast, Oikawa discloses a concentration of sodium in a target, not within the metal film of the wiring. See e.g. col. 6, lns. 13-31 and col. 8, lns. 1-16 in Oikawa. There is no disclosure or suggestion in Oikawa of the sodium concentration of the metal film of the wiring. The sodium concentration of the target is not the same as the sodium concentration in the metal film of the wiring. For example, the specification of the present application recites a target purity (e.g. page 8, lns. 22-24) and a sodium concentration for a metal film of a wiring (e.g. page 9, lns. 10-12 and page 10, lns. 6-11). Each of these is discussed separately, in a different place and manner in the specification since they are not the same. Hence, one skilled in the art reading the specification of the present application would understand that these are not the same and that the teaching regarding the target concentration is not the same as the teaching regarding the concentration of the metal film of the wiring

In contrast, there has been no showing by the Examiner as to where there is a teaching in Oikawa of the concentration of the metal film of the wiring or how one skilled in the art would arrive at the concentration of the metal film of the wiring from the concentration of the target.

MPEP §2142 states that in order to establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. The Examiner has cited no such suggestion or motivation to modify the teaching in Oikawa of the target concentration to arrive at a teaching of the concentration of the metal film of the wiring. MPEP §2142 further states that the prior art reference (or references when combined) must teach or suggest all the claim limitations. In this case, there is no teaching or suggestion in Oikawa or Oikawa combined with Prall of the claimed limitation of the concentration of the metal film of the wiring. Hence, the Examiner has failed to establish a prima facie case of obviousness.

Further, Oikawa discloses a sodium concentration only in a molybdenum target. There is no disclosure of an impurity concentration in other metals, such as tungsten.

Therefore, for at least the above-stated reasons, the cited references do not disclose or suggest the claimed invention, the Examiner has failed to establish a prima facie case of obviousness, and the rejected claims are patentable over the cited references. Accordingly, it is respectfully requested that this rejection be withdrawn.

Claims 5, 12, 17, 41 and 48

The Examiner also rejects Claims 5, 12, 17, 41 and 48 under 35 USC §103 as being unpatentable over Oikawa in view of Prall and further in view of Ikeda et al. (JP 8-153722). This rejection is also respectfully traversed.

Each of these claims is a dependent claim. Therefore, for at least the reasons discussed above for the independent claims, each of these dependent claims is also patentable over the cited references. Accordingly, it is respectfully requested that this rejection also be withdrawn.

Conclusion

It is respectfully submitted that the present application is in a condition for allowance and should be allowed.


If any further fee should be due for this Response or the terminal disclaimer, please charge our deposit account 50/1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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Mark J. Murphy
Registration No. 34,225

COOK, ALEX, McFARRON, MANZO,
CUMMINGS & MEHLER, LTD.
200 West Adams Street
Suite 2850
Chicago, Illinois 60606
(312) 236-8500

Customer no. 000026568